

## **ABSTRACT**

This invention relates to novel methods for affecting, controlling and/or directing various reactions and/or reaction pathways or systems by exposing one or more components in a holoreaction system to at least one spectral energy pattern. In a first aspect of the invention, at least one spectral energy pattern can be applied to a reaction system. In a second aspect of the invention, at least one spectral energy conditioning pattern can be applied to a conditioning reaction system. The spectral energy conditioning pattern can, for example, be applied at a separate location from the reaction vessel (e.g., in a conditioning reaction vessel) or can be applied in (or to) the reaction vessel, but prior to other reaction system participants being introduced into the reaction vessel.

The techniques of the present invention are applicable to certain reactions in various cell reaction systems, including but not limited to, the following known cells: galvanic cells, electrochemical cells, electrolytic cells, fuel cells, batteries, photoelectrochemical cells, photogalvanic cells, photoelectrolytic cells, capacitors. Cell reaction systems can be organic, biologic and/or inorganic. The invention also relates to mimicking various mechanisms of action of various catalysts in cell reaction systems under various environmental reaction conditions. The invention specifically discloses different means for achieving the control of energy dynamics (e.g., matching or non-matching) between, for example, applied energy and matter (e.g., solids, liquids, gases, plasmas and/or combinations or portions thereof), to achieve (or to prevent) and/or increase energy transfer to, for example, at least one participant (or at least one conditionable participant) in a holoreaction system by taking into account various energy considerations in the holoreaction system. The invention further discloses different techniques and different means for delivery of at least one spectral energy pattern (or at least one spectral energy conditioning pattern) to at least a portion of a cell reaction system. The invention also discloses an approach for designing or determining appropriate physical catalyst(s) and/or conditioned participants to be used in a cell reaction system.